Abstract Submitted
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Toroidal Ion Temperature Gradient Modes and Angular Momentum Transfer[1] M. LANDREMAN, B. COPPI, MIT — Toroidal modes driven by the ion temperature gradient[2] are commonly thought to be responsible for the observed transport of ion thermal energy in high temperature plasmas. These modes have a toroidal phase velocity in the direction of the ion diamagnetic velocity for a considerable range of their transverse wavelengths, but for some parameters the phase velocity reverses. Modes of odd parity - meaning the electrostatic potential is an odd function of the poloidal angle measured relative to the equatorial plane - are driven primarily by the combined effects of the geodesic curvature, ion temperature gradient, and shear of the magnetic field. The odd parity modes are not stabilized by collisionality to the same extent as are the even parity modes. Therefore, in the L-regime the odd modes can be excited near the edge of the plasma where η_i can be significant. In this case the modes may be responsible for ejection of angular momentum in the ion diamagnetic velocity direction. Such ejection is required by the accretion theory of spontaneous rotation[3]. Correlation with experiments on Alcator C-Mod is given. [1]Sponsored in part by the US DOE and NSF. [2]B. Coppi and F. Pegoraro, Nucl. Fus. 17, 969 (1977). [3]B. Coppi, Nucl. Fus. 42, 1 (2002).

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